

1966 OPERATING SUMMARY

FORT ERIE

**water pollution
control plant**

TD227
F66
W38
1966
MOE

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ONTARIO WATER RESOURCES COMMISSION

Division of Plant Operations

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ONTARIO WATER RESOURCES COMMISSION

OFFICE OF THE GENERAL MANAGER

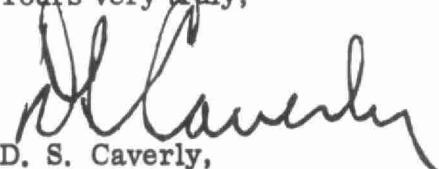
Members of the Fort Erie Local Advisory Committee,
Town of Fort Erie.

Gentlemen:

We are pleased to submit to you the 1966 Operating Summary for the
Fort Erie Water Pollution Control Plant, OWRC Project No. 59-S-39.

It is hoped that our joint participation in efforts to combat water pollution
will have even more success in the coming year.

Yours very truly,


D. S. Caverly,
General Manager.

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227
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W38
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ONTARIO WATER RESOURCES COMMISSION

801 BAY STREET

TORONTO 5

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D. S. CAVERLY
GENERAL MANAGER

W. S. MACDONNELL
COMMISSION SECRETARY

General Manager,
Ontario Water Resources Commission.

Dear Sir:

I am happy to present you with the 1966 Operating Summary for the Fort Erie Water Pollution Control Plant, OWRC Project No. 59-S-39.

The report offers a concise summary of operating data for the year and comparisons with previous years where these are applicable and significant.

Yours very truly,

A handwritten signature in black ink, appearing to read "B.C. Palmer".

B. C. Palmer, P. Eng.,
Director,
Division of Plant Operations.

FOREWORD

● This operating summary contains complete information on the management of the project during 1966. It contains a concise review of the year's plant operation, significant financial details, and a visual presentation in graphs and charts of technical performance.

The information will be of value to interested parties in assessing the adequacy of the project at this time and its ability to meet future requirements.

The report is the result of co-operation by several groups within the Division of Plant Operations. These include the statistics section and the technical publications section. The Division of Finance and the draughting section of the Division of Sanitary Engineering were also closely associated with its publication.

The Regional Operations Engineer, however, has had the primary responsibility for the content, and will be happy to answer any questions regarding it.

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FORT ERIE
water pollution control plant

operated for

THE TOWN OF FORT ERIE

by the

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Operations Engineer: R. S. McKittrick

801 Bay Street Toronto 5

'66 REVIEW

The operating cost for the year was \$26,123.29 as opposed to \$24,836.97 in 1964. However, the operating cost per million gallons of sewage treated was down from \$46.38 to \$43.29.

On the basis of the 1966 sampling program, it is apparent that the organic strength of the raw sewage is somewhat less than the average sewage received in 1965. On the basis of our limited knowledge of the municipal collection system, all indications are that the degree of infiltration has increased in 1966 over 1965. Because of the weaker raw sewage the cost per pound of BOD removed increased in 1966 from 12¢ per pound to 19¢.

A total of 603.5 million gallons of raw sewage was treated at the plant during 1966 as compared to 535.5 million gallons in 1965. This is an increase of 12.7%. The average daily flow for the year was 1.66 million gallons or 92% of the plant design dry weather flow of 1.8 million gallons. The dry weather design flow was exceeded 32% of the time during 1966 indicating a high degree of infiltration into the municipal sewers. This infiltration was confirmed by the raw sewage strength which was, on the average, relatively weak.

The ozonation equipment installed in the pumping station in an attempt to eliminate a stubborn odour problem met with considerable success during 1966. Following several confrontations with residents in the immediate area of the pumping station it became evident to these people that many of the odours which they had previously attributed to the pumping station were in fact from industries located on the American side directly across the Niagara River. Following one year of evaluation, it has been generally agreed that the ozonation equipment was successful in the elimination of odours from the pumping station.

Maintenance at the plant and pumping station was during the past year, of a high calibre. Inspection of one primary digester mixer revealed considerable deterioration of the propeller of this unit. An order was placed late in 1966 for replacement parts and these will be installed upon receipt in the spring of 1967. It is hoped that improved mixing in the digester will increase methane gas production and also eliminate a scum buildup problem which has plagued the plant since its inception.

The plant staff consists of a chief operator and operator and supervision at the plant is on a five day a week basis for 8 hours per day with call-in on weekends and statuatory holidays.

The staff, with assistance from the OWRC Head Office staff, have been successful during the past year in operating an efficient and attractive project.

PROJECT COSTS

NET CAPITAL COST (Final)	\$807,050.52
DEDUCT - Portion Financed by CMHC (Final)	\$535,794.31
- Payments from Municipalities	<u>55,000.00</u>
	<u>590.794.31</u>
Long Term Debt to OWRC	<u>\$216,256.21</u>
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1966	\$ <u>17,241.28</u>
Net Operating	\$ 26,123.29
Debt Retirement	4,349.00
Reserve	5,368.62
Interest Charged	12,128.64
TOTAL	\$ <u>47,969.55</u>

RESERVE ACCOUNT

Balance at January 1, 1966	\$ 12,631.55
Deposited by Municipality	5,368.62
Interest Earned	799.99
	<u>\$ 18,800.16</u>
Less Expenditures	349.00
Balance at December 31, 1966	\$ <u>18,451.16</u>

MONTHLY OPERATING COSTS

MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIPMENT	REPAIRS & MAINTENANCE	* SUNDAY
JAN	1317.04	817.45					102.59	380.00		17.00
FEB	1627.71	775.22		101.18	360.64		113.08		124.41	153.18
MARCH	1825.59	803.62		84.99	375.08		70.82 (286.82)		15.60	761.30
APRIL	2269.85	1219.63		72.78	348.46		139.82	213.00	75.07	201.09
MAY	4136.90	832.90		68.57	342.52		114.10		17.18	2761.53
JUNE	1991.13	910.47	159.96	40.98	348.16		254.89	178.29	37.67	60.71
JULY	1825.80	822.66	234.04	24.18	318.06		192.79	36.01		198.06
AUG	2882.01	822.66	172.41	19.84	302.85	1050.83	93.18	12.00	191.02	217.22
SEPT	2036.79	1240.99	214.50	31.38	349.30		75.49	22.52	7.50	95.11
OCT	1861.68	845.17		22.30	310.34		60.02		239.91	383.94
NOV	1974.21	835.42	33.43	37.77	292.01		121.95	163.17	98.38	392.08
DEC	2374.58	845.62		131.81	796.53		97.20	71.74	164.60	267.08
TOTAL	26123.29	10771.81	814.34	635.78	4144.95	1050.83	1435.93	789.91	971.34	5508.40

* SUNDAY INCLUDES SLUDGE HAULING COSTS WHICH WERE \$711.24

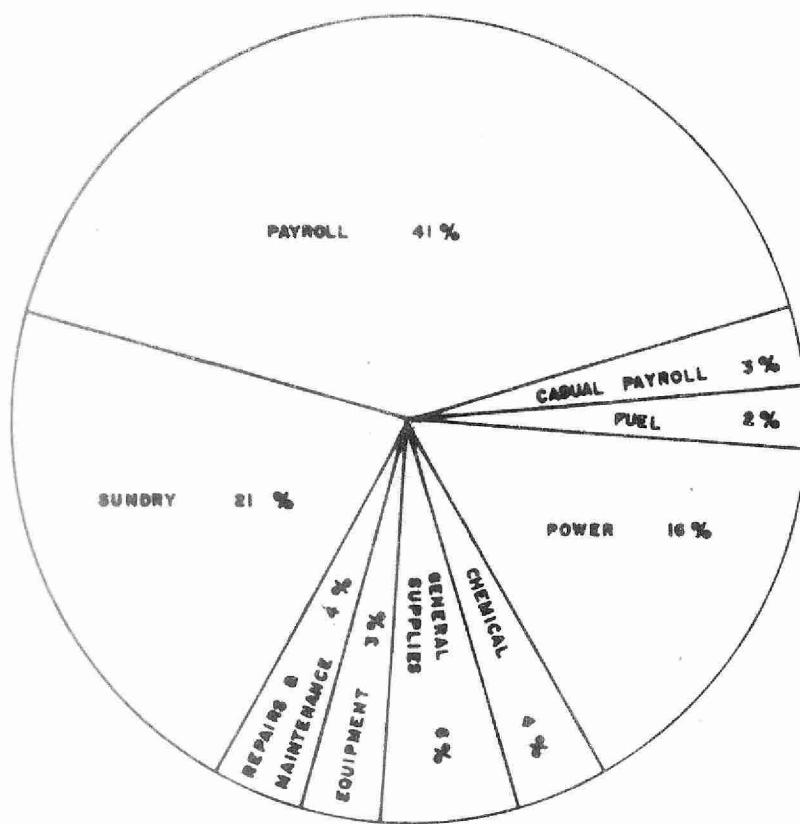
BRACKETS INDICATE CREDIT

YEARLY OPERATING COSTS

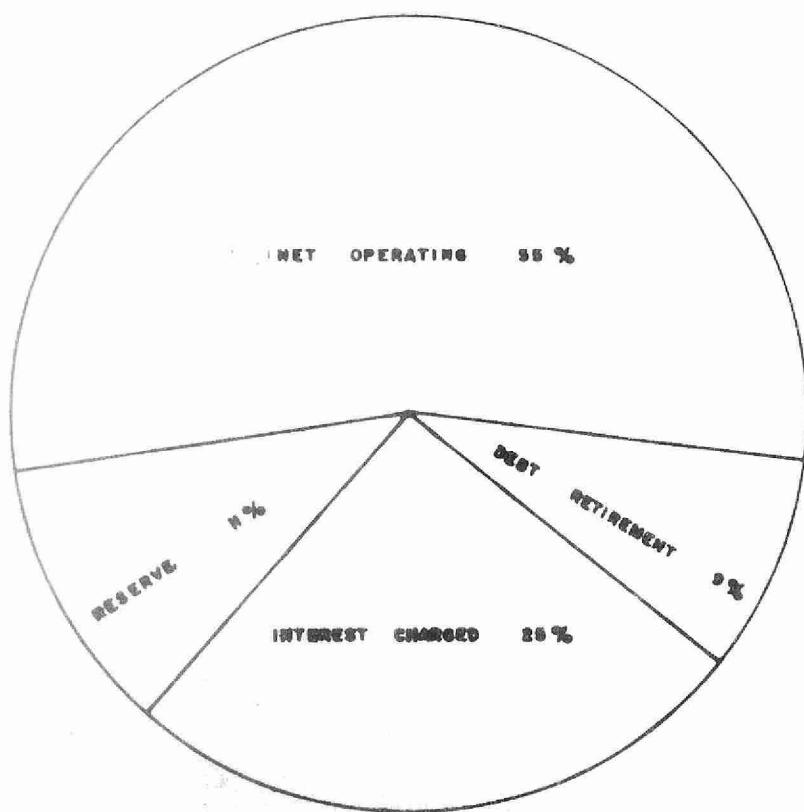
YEAR	M.G. TREATED	TOTAL COST	COST PER FAMILY PER YEAR	COST PER MILLION GALLONS	COST PER L.B. OF BOD REMOVED
1964	512.92	\$23886.73	\$10.06	\$46.57	18 CENTS
1965	535.46	\$24836.97	\$10.49	\$46.38	12 CENTS
1966	603.50	\$26123.29	\$10.92	\$43.29	19 CENTS

* BASED ON ANNUAL POPULATION ESTIMATE AND 3.9 PERSONS PER FAMILY

1966 OPERATING COSTS



TOTAL ANNUAL COST

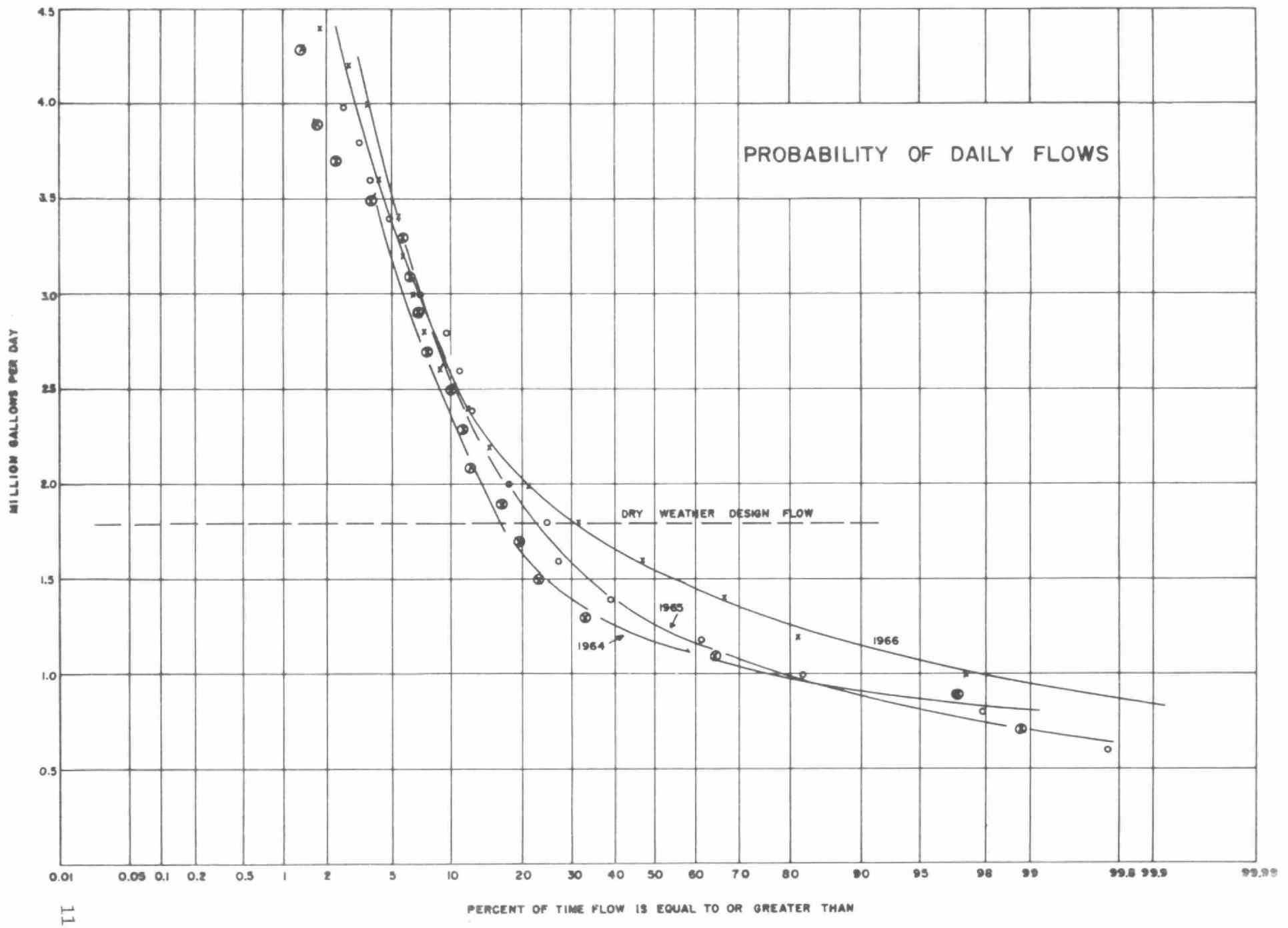


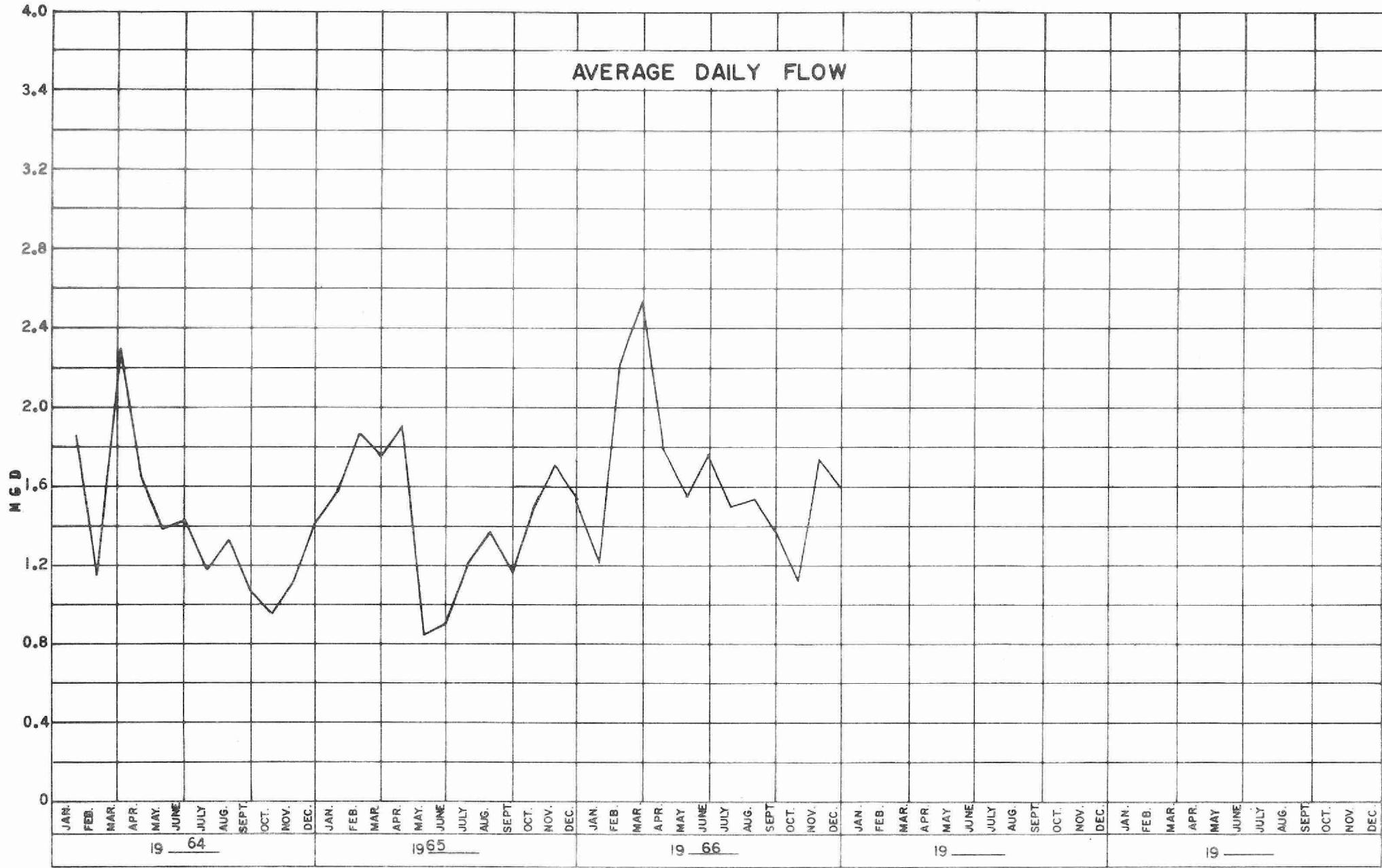
Process Data

A total of 603.5 million gallons of raw sewage was treated at the plant during 1966 as compared to 535.5 million gallons in 1965. This is an increase of 12.7%.

The month of March contributed the highest monthly flow of 78.58 million gallons while October was the lowest with only 34.83 million gallons. The highest daily recorded flow was 5.15 million gallons in March and the lowest was 0.88 million gallons in September.

The dry weather design flow was exceeded 31% of the time in 1966 as compared to 23% of the time in 1965.

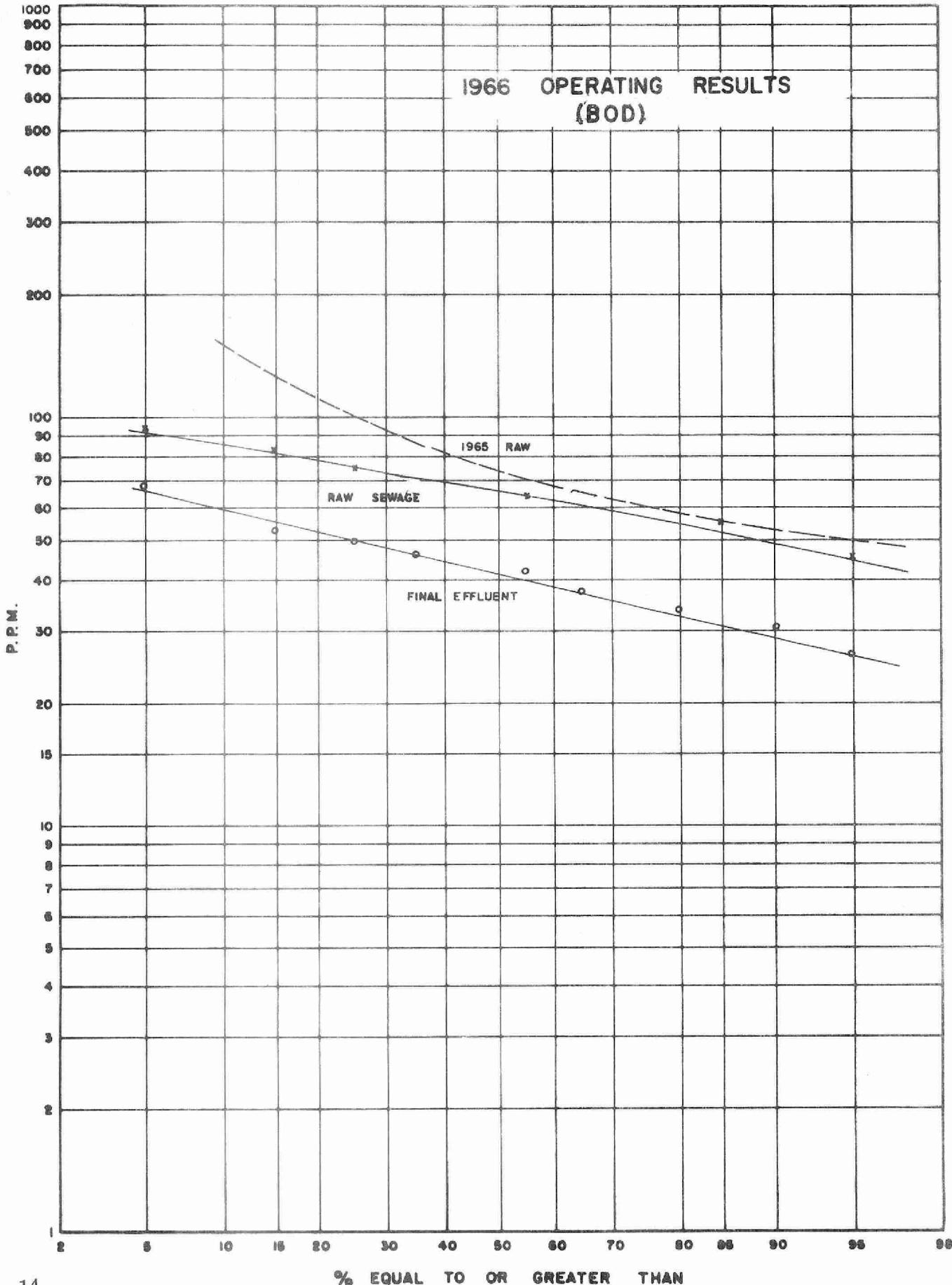


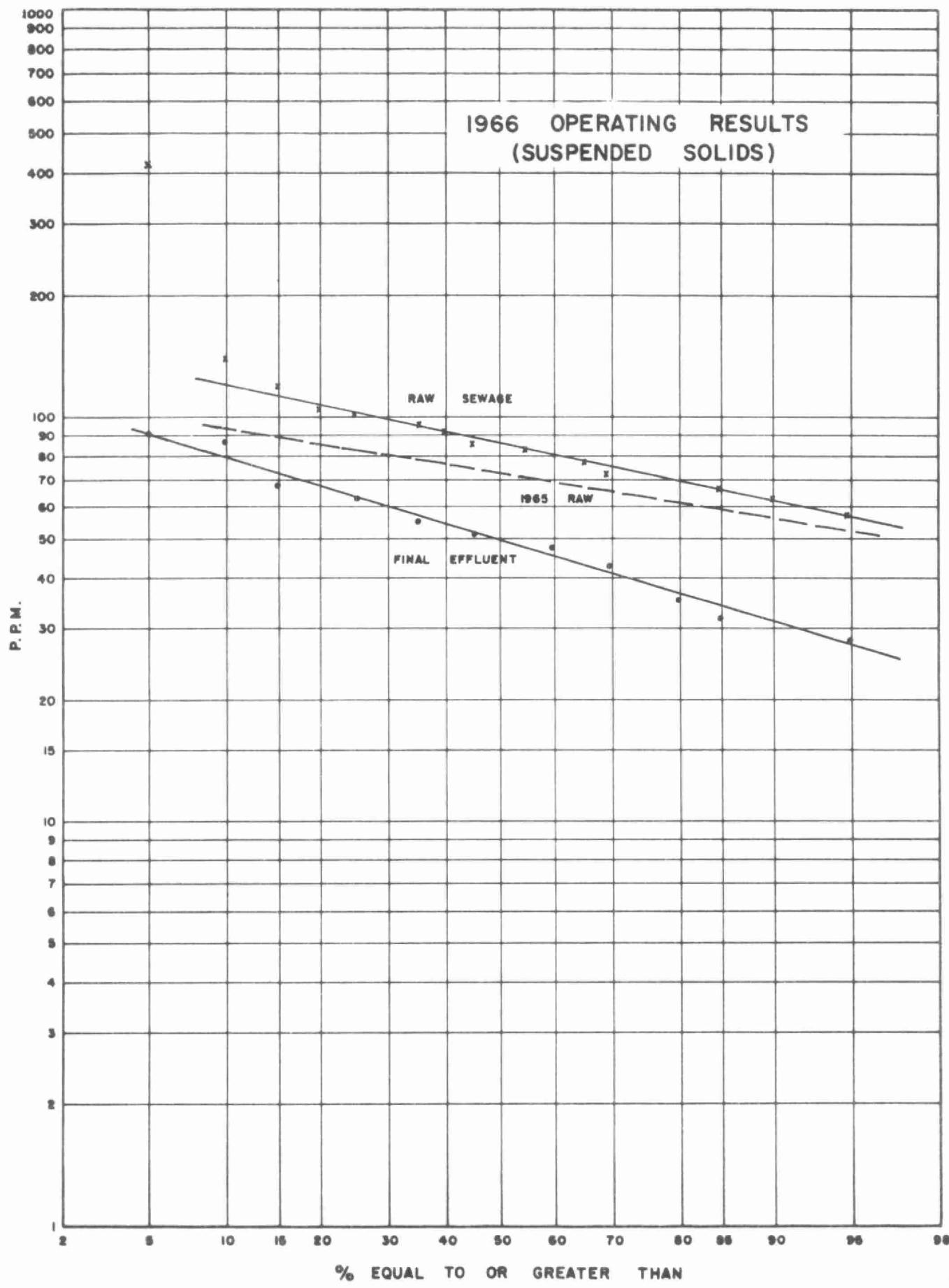


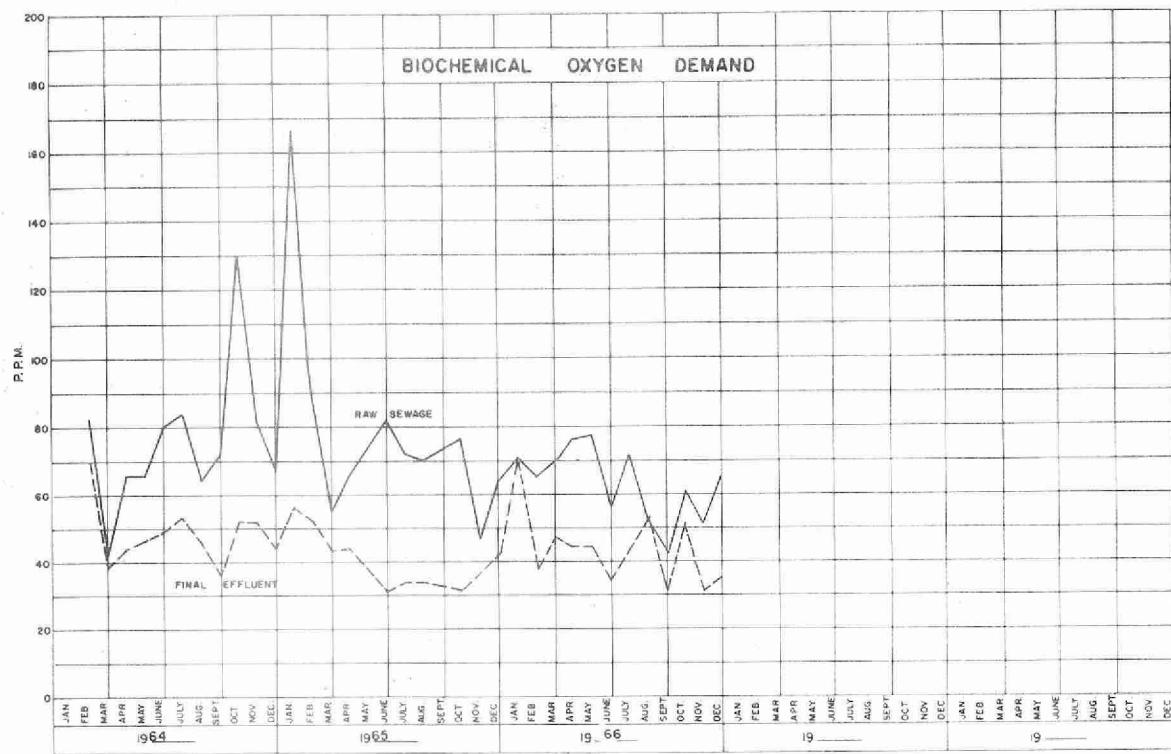
FLOW SUMMARY

Month	Total Flow	Max. 24 hr. Flow MG	Max. Instan. Flow MG	Min. 24 hr. Flow MG
January	38.03	1.79	7.50	0.90
February	61.98	4.54	5.90	1.20
March	78.58	5.15	6.20	1.48
April	53.53	3.20	5.40	1.34
May	48.28	3.09	5.20	1.27
June	53.54	3.62	4.70	1.28
July	45.96	2.34	4.60	1.06
August	47.03	2.10	5.40	0.89
September	40.69	2.19	5.20	0.88
October	34.83	1.37	5.00	1.01
November	51.81	4.25	5.70	0.98
December	49.24	4.87	5.60	0.87
Total	603.50	-	-	-
Average	50.29	3.21	5.53	1.10

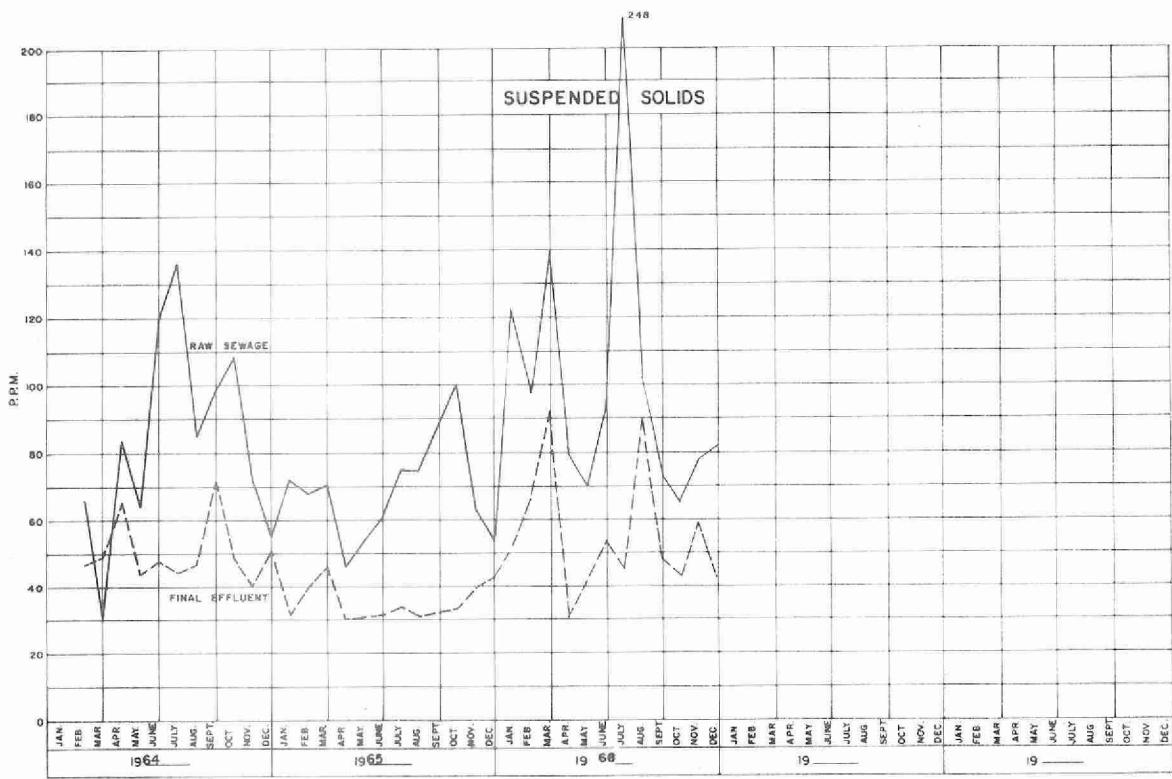
1966 OPERATING RESULTS
(BOD)







MONTHLY VARIATIONS



GRIT, B.O.D AND S.S. REMOVAL

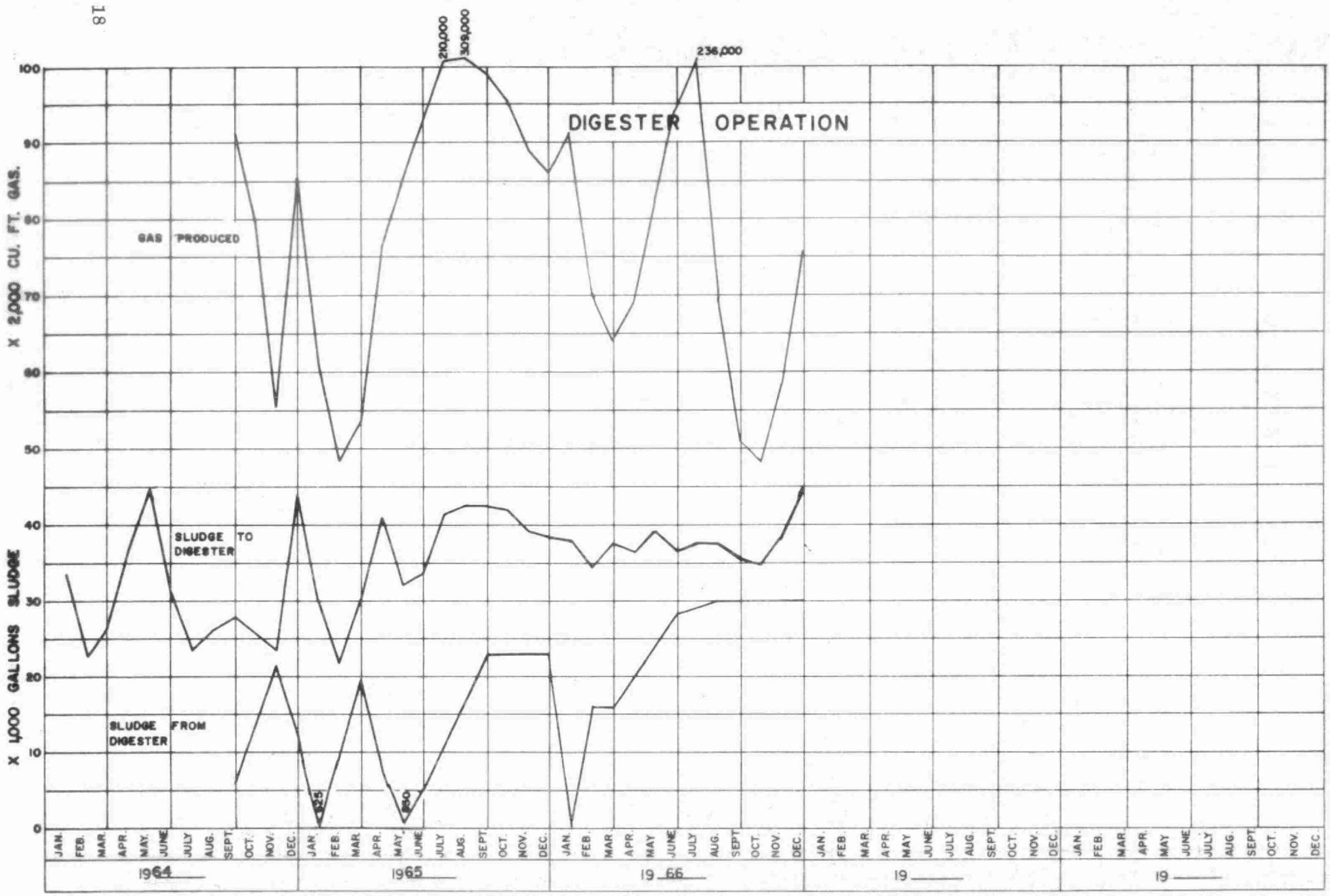
MONTH	B. O. D.				S. S.				GRIT REMOVAL CU. FT.
	INFLUENT PPM.	EFFLUENT PPM.	% REDUCTION	TONS REMOVED	INFLUENT PPM.	EFFLUENT PPM.	% REDUCTION	TONS REMOVED	
JAN.	*63	40	36.5	4.4	122	52	57.5	13.3	-
FEB.	65	37	43.0	8.7	97	67	31.0	9.3	18.0
MAR.	69	47	32.0	8.6	140	92	34.5	18.6	7.0
APR.	76	44	42.0	8.6	80	30	62.5	13.4	1.0
MAY	77	44	43.0	8.0	70	42	40.0	6.8	0.5
JUNE	56	34	39.5	5.9	94	54	42.5	10.7	0.0
JULY	72	43	40.5	6.7	248	45	82.0	46.6	1.0
AUG.	63	40	36.5	5.4	102	90	12.0	2.8	6.0
SEPT.	42	30	28.5	2.4	74	48	35.0	5.3	3.0
OCT.	61	51	16.5	1.7	65	43	39.0	3.8	-
NOV.	51	31	39.0	5.2	78	59	24.5	4.9	8.0
DEC.	65	35	46.0	7.4	82	42	49.0	9.8	3.0
TOTAL	-	-	-	69.4	-	-	-	147.8	47.5
AVG.	63	40	36.5	5.8	104	55	47.0	12.3	4.0

COMMENTS

The average strength of the raw sewage in 1966 was well below design values, 63 ppm actual versus 190 ppm BOD design and 104 ppm actual versus a design value of 130 ppm suspended solids. These figures indicate that considerable dilution of normal domestic sewage is occurring.

The removal efficiencies with an average 43% reduction in BOD and 47% in SS would appear to be quite reasonable in view of the low strength wastes being treated at the plant.

The grit removed at the plant is very much below normal averaging less than 0.08 cubic feet per million gallons. A relatively flat grade on the Niagara Parkway trunk sewer is felt to be a contributing cause of the low grit quantities.



DIGESTER OPERATION

MONTH	SLUDGE TO DIGESTERS			SLUDGE FROM DIGESTERS			GAS PRODUCED 1000'S Cu. Ft.
	1000'S CU FT.	% SOLIDS	% VOL. MAT.	1000'S CU. FT.	% SOLIDS	% VOL. MAT.	
JAN.	6.14	5.90	-	0.12	10.50	-	183.00
FEB.	5.54	6.05	-	2.56	9.95	-	140.00
MAR.	6.03	4.28	-	2.56	11.62	5.21	128.00
APR.	5.86	6.07	4.53	-	10.42	4.63	138.00
MAY	6.27	6.82	4.73	-	11.20	5.31	165.00
JUNE	5.90	7.73	5.19	4.49	9.87	4.66	188.00
JULY	6.07	7.05	4.74	-	10.35	4.90	236.00
AUG.	5.99	9.98	6.15	4.81	12.58	5.47	138.00
SEPT.	5.72	7.83	4.83	-	10.93	4.27	102.00
OCT.	5.59	6.62	4.57	4.81	11.67	5.23	97.00
NOV.	6.11	5.97	3.85	-	8.60	4.36	117.00
DEC.	7.09	9.77	5.78	-	9.07	4.14	149.00
TOTAL	72.31	-	-	19.35	-	-	1781.00
AVG.	6.03	7.01	4.93	1.61	10.56	4.82	148.42

COMMENTS

The amount of sludge pumped to the digester increased by approximately 3.2% to 72,310 cubic feet in 1966 at an average solids content of 7.0%.

The gas production in 1966 was 24.7 cubic feet per cubic foot of sludge pumped to digester as compared to 29.9 cubic feet of gas per cubic foot of sludge in 1965. The quantity of sludge hauled in 1966 increased to 19,350 cubic feet from 8,280 cubic feet in 1965. This increase in sludge haulage indicates less amounts of supernatant returned to the primary clarifiers.

The poor gas production can be attributed to a weaker raw sewage during the past year and also defective mixing equipment. Repairs are to be made to the latter in the spring of 1967.

CHLORINATION

Month	Flow	Pounds of Chlorine Used		
		Influent	Effluent	Total
January	38.03	-	-	-
February	61.98	-	-	-
March	78.58	-	-	-
April	53.53	17	51	68 *
May	48.28	278	835	1113 **
June	53.54	504	1514	2018
July	45.96	721	2163	2884
August	47.03	730	2196	2926
September	40.69	618	1844	2462
October	34.83	628	1882	2510
November	51.81	553	*** 811	1364
December	49.24	532	-	532
Total	603.50	4581	11296	15877
Average	50.29	509	1412	1764

* 3 days chlorination

** 16 days chlorination

*** 17 days chlorination

COMMENTS

Chlorine was added to the effluent from May 15 to November 17 and a 15 minute residual of 0.5 ppm was maintained. The chlorine dosage is automatically controlled in direct relation to the plant flow and provides a degree of disinfection of the final effluent

Influent chlorination is practiced in order to eliminate odours within the detritor room.

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CONCLUSIONS

Following a one-year evaluation period, it is concluded that the ozonation equipment installed at the pumping station was successful in eliminating the odour problem.

The average daily flow for the past year was 92% of the dry weather design flow and it is concluded that if steps are not taken to eliminate some of the infiltration gaining access to the municipal sewers the plant will be hydraulically overloaded in the near future.

There was a further reduction in the strength of the raw sewage in 1966 which partially resulted in a decrease in the amount of methane gas produced in the primary digester.

The cost of operation per million gallons of \$43.29 was within the range anticipated for this type and size of plant.

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